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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,591	10/08/2004	Hendrik Klaas Kloen	NL02 0327 US	9251

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PHILIPS ELECTRONICS NORTH AMERICA CORPORATION
INTELLECTUAL PROPERTY & STANDARDS
1109 MCKAY DRIVE, M/S-41SJ
SAN JOSE, CA 95131

EXAMINER	
CHU, CHRIS C	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/510,591	KLOEN ET AL.	
	Examiner	Art Unit	
	Chris C. Chu	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/12/05*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on November 16, 2005 has been received and entered in the case.

Information Disclosure Statement

2. The listing of references, e.g., EP-A 1160858, in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Since applicant fails to submit the listing of references in an IDS form in a separate paper as stated in the above paragraph, the listing of references have not been considered and the above statement is maintained.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used

in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," "In an example embodiment," etc.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 – 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. (U. S. Pat. No. 5,656,550) in view of Jung et al. (U. S. Pat. No. 6,333,252).

Regarding claim 1, Tsuji et al. discloses in e.g., Fig. 21C a semiconductor device (the device in e.g., Fig. 21C) comprising

- a carrier (60 in Fig. 20A; column 16, line 28) with a first and a second side situated opposite to each other,
    - o which carrier has a first electroconductive layer (62; column 16, line 33) on the first side (see e.g., Fig. 21C),
    - o the first electroconductive layer (62) is patterned in accordance with a desired pattern, thereby defining a number of mutually isolated connection conductors (27; column 16, line 37 and see e.g., Fig. 21C)

separated by apertures (the gaps between the elements 27; see e.g., Fig. 21C),

- on which first side of the carrier a semiconductor element (41; column 17, line 27) is present (see e.g., Fig. 21C),
    - which semiconductor element (41) is provided with connection regions (41a; column 17, line 29) that are electroconductively connected via connection means (43; column 17, line 32) with the connection conductors (27) of the carrier (see e.g., Fig. 21C),
    - which semiconductor element (41) is encapsulated in a passivating envelope (23; column 17, line 33) that extends as far as the carrier (see e.g., Fig. 21C),
- on which second side, contact surfaces (at the surface of the elements 63) are defined in the connection conductors (27) for placement on a substrate (column 35, line 16),
- characterized in that the envelope (23) is mechanically anchored in the connection conductors (27), for which purpose the connection conductors (27) are provided with side faces having recesses (see e.g., Fig. 21C and column 17, lines 1 – 6).

Tsuji et al. does not disclose the bottom surface of the passivating envelope extending as far as the second side of the carrier, but does not cover the second side of the carrier. Jung et al. teaches in e.g., Fig. 2 and column 3, lines 1 – 4 the bottom surface of a passivating envelope (220; column 2, line 63) extending as far as the second side of a carrier (230 and 232; column 2, line 62), but does not cover the second side of the carrier

(see e.g., Fig. 2 and column 3, lines 1 – 4). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the bottom surface of the passivating envelope of Jung et al. to be the passivating envelope of Tsuji et al. as taught by Jung et al. to prolong the path and time for moisture diffusion into the semiconductor device and increase the adhesive strength between the isolated connection conductors and the package body (column 2, lines 64 – 67).

Regarding claim 2, Tsuji et al. discloses in e.g., Fig. 21C in addition to the first layer (62), the carrier comprises a second layer (61 in Fig. 20A) and a third layer (63; column 16, line 33), the second layer comprising a material that can be etched in an etchant that leaves the first and the third layer substantially in tact (see e.g., Fig. 21C and column 17, lines 1 – 6).

Regarding claim 3, Tsuji et al. discloses in e.g., Fig. 21C apertures (the gaps or openings between the element 27 and the elements 28A) extending as far as the second side of the carrier (see e.g., Fig. 21C).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. and Jung et al. as applied to claim 1 above, and further in view of Rostoker (U. S. Pat. No. 5,340,771).

While Tsuji et al. and Jung et al. disclose the connection means being wires, Tsuji et al. and Jung et al. do not teach the connection means could be bumps. Rostoker teaches in e.g., Fig. 1a the connection means also being bumps (108; column 5, line 57), which bumps (108) are also used to attach a semiconductor element (102; column 5, lines 56 – 57) onto a carrier (110; column 5, lines 49 – 50). It would have been obvious to one of

ordinary skill in the art at the time when the invention was made to apply the bumps of Rostoker on the semiconductor element of Tsuji et al. and Jung et al. as taught by Rostoker to increase the number of I/O connections (column 4, lines 6 – 7).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. and Jung et al. as applied to claim 2 above, and further in view of Osawa et al. (U. S. Pat. No. 6,077,727).

While Tsuji et al. and Jung et al. disclose the carrier having first, second and third layers, Tsuji et al. and Jung et al. do not teach the first and third layer being copper and the second layer being aluminum. Osawa et al. teaches in e.g., Fig. 9D first (52; Cu, column 1, lines 32 – 33) and third (53; Cu, column 1, lines 31 – 32) layers being composed by a copper and the second layer (51) being composed by an aluminum (column 1, line 32). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the copper and aluminum of Osawa et al. as the specific material to form the first, third and second layers in the carrier of Tsuji et al. and Jung et al. as taught by Osawa et al. to selectively remove by the etching process (column 1, lines 37 – 38).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. and Jung et al. as applied to claim 1 above, and further in view of Harada (U. S. Pat. No. 6,091,144).

While Tsuji et al. and Jung et al. disclose the use of the carrier, Tsuji et al. and Jung et al. do not teach the carrier comprising a number of electrically insulating and

conductive layers, at least one passive component being embedded in said layers. Harada teaches in e.g., Fig. 4A a carrier (22a, 12, 14a and 14b) comprising a number of electrically insulating (26a, 26b and 32; column 6, lines 25 – 26) and conductive layers (12, 28a and 28b; column 6, lines 24 – 25), at least one passive component (22a; capacitor, column 6, line 23) being embedded in said layers (12, 26a, 26b, 28a, 28b and 32; see e.g., Fig. 4A). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the number of electrically insulating and conductive layers and the passive component of Harada into the carrier of Tsuji et al. and Jung et al. as taught by Harada to reduce adverse effect of noise on external circuits (column 3, lines 12 – 13).

Response to Arguments

9. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu
Examiner
Art Unit 2815

c.c.
Thursday, February 02, 2006

ALLAN R. WILSON
PRIMARY EXAMINER